VOLUME VI NUMBER 9

THE ELEMENTARY SCHOOL TEACHER

MAY, 1906

A SOCIAL SCIENCE OUTLINE—THE POINT OF VIEW

JOHN S. WELCH
Supervisor, University of Utah Normal Training School

History is a study of the stream of intellect and emotion flowing through the past and shaping itself in the institutional life of the people, social, industrial, political, religious. It traces the causes of these institutions—their formation, *trans*formation, and *re*formation. It deals essentially with the past, what man was as a fit background for an appreciation of what man is.

The student of history sees this stream, continuous, ever-varying, ever-broadening, ever-shaping itself anew, as it flows from the ancient civilizations of the Orient, through Greece and Rome, through Latin and Anglo-Saxon Europe, and finally culminating in democracy's latest hope, the Republic of North America. This is the philosophic aim and purpose of history.

Social science aims to utilize all that is vital in this organization of history, and to project it forward. It assumes that man can be understood as he is only when there is an intelligent appreciation of what man would be. *What is*, is transient. The abiding thing is *the ought to be:* the permanent thing, *the law of change.*

Social science is essentially the study of the present *in the process of becoming.* It links the future with the past, and makes intelligible the purpose divine that molds and shapes the institutional life of man. It is the study of the individual in his group-relations—the interdependence, the community of interests, the common hopes, aims, aspirations. Professor Horne says: "As

the child merges from boyhood to manhood, the brook of promise must empty itself in the river of service."

Social science must therefore include a study of what we, the social group, are doing and whither we are tending. The organization of a social group in terms of effective, progressive service is a legitimate and vital topic for first-hand investigation. Its end and aim is purposeful citizenship through regnant character.

The school has an important function to perform, if ours is to continue a government of the people. A person is as his ideals are. So a nation. Children who leave school without worthy ideals of life, and without the real significance of a community of interests wrought into the very nerve and fiber of their beings, have been defrauded, and the school has failed to perform its most vital function.

Social science must foster the patriotism that germinates in the home, causing it to move out in ever-widening circles through the community, the city, the state, the nation, until there dawns a consciousness of world-citizenship in which the interests of one are the interests of all and the dream of Tennyson has indeed been realized:

> Then the war-drum throbb'd no longer, and the battle-flags were furl'd
> In the Parliament of man, the Federation of the world.

Let our aim and purpose be to plant a seed that may bud and blossom in a consciousness of the fact that we are the heirs of all that which the ages have accomplished through blood and toil, through heroic struggle and noble self-sacrifice. Therefore we are responsible, not alone for its preservation, but also for the contributing of our mite to the realization of the ideal toward which humanity has all the while been tending.

> Other futures stir the world's great heart,
> The West now enters on the heritage
> Won from the tomb of mighty ancestors,
> The seeds, the gold, the gems, the silent harps
> That lay deep buried with the memories of old renown.

GENERAL SUGGESTIONS

The justification of a public-school system lies not in the material success of the individual *per se*, his ability to make con-

ditions better for himself; but it does lie in the gain to the state in terms of citizenship. The interests of the state and the individual are one just so far as his individual advancement means greater efficiency in terms of service, positive, dynamic.

The counting-chamber and the business office have dominated the schools too long. The first essential is a citizen fit to live; the second, his manner of making a living. It is no longer the problem of the survival of the fittest, but rather the problem of making fit to survive.

The N. E. A. regrets the revival in some quarters of the idea that the common school is a place for teaching nothing but reading, spelling, writing, and ciphering, and takes this occasion to declare that the ultimate object of popular education is to teach the children how to live righteously, healthily, and happily, and to accomplish this it is essential that every school inculcate the love of truth, justice, purity, and beauty.—Declaration of principles, N. E. A., 1905.

The children should early be imbued with the idea that it is their *privilege* to attend school, not an unquestionable, inalienable *right;* that the schools belong to the parents in the sense of the group, the state, but that no individual parent has any exclusive jurisdiction.

The aim and purpose should be: first, to secure a worthy citizenship of the room, the school, the neighborhood, with an intelligent, constructive appreciation of property rights and group-interests. Children who are not in the process of becoming good citizens here and now; who do not feel their mutual rights and responsibilities; in a word, who are not good citizens of the home, the school, the neighborhood, will scarcely reach the ideal citizenship which the state—the group—has a right to expect.

The school property of the United States is valued at $500,000,000; the income for school purposes, at $220,000,000 annually; the teachers of the United States number 500,000; the children, between the ages of five and eighteen, who attend school, more than 20,000,000. These schools are built, this money is expended, these children are accommodated by those who now constitute the state, in order that the accumulated wealth of the race, material and spiritual, may be preserved and the ideals of the race finally realized.

SPECIFIC STUDY

ALL GRADES IN TERMS OF AGE AND EXPERIENCE OF THE CHILDREN.

Estimate the value of school grounds, school buildings, equipment, cost of maintenance, etc. Who pays for all this? What do they receive for their money? Why a willingness to pay?

The aim and purpose of school organization. What we do *to help—to hinder*—the process. What should be expected of us.

Our obligations in terms of—

The lunch problem.

The waste-material problem.

The rainy-day problem.

The snow problem.

Our rights and the rights of others. Is there any conflict?

Consider the janitor service. The need for. What is he doing for us. How he is *helped—hindered*— in his work.

Consider the significance of forming in line, of marching, of forming in groups, of group-movements, etc.

In group or class-work, whose time can be squandered? If a group is hindered by an individual, by what right does he retain membership in the group?

Consider the function of teacher and pupil in the school process. The teacher can merely make conditions for growth. The child determines the growth.

Sum up in terms of individual privilege, opportunity, and *responsibility*.

PRIMARY GRADES

A study of individuals typifying a class in the social organization.

In making a study of the individual in terms of service, the teacher should keep in the foreground of the child's consciousness the fact that, while all human beings require food, clothing, and shelter, the differentiation of labor, in terms of these becomes justifiable only when by such means these problems can be solved more effectively and economically for all concerned.

KINDERGARTEN

GENESIS OF THE SOCIAL CONSCIOUSNESS

The socializing process in the kindergarten must begin with the dawning consciousness of the limits placed upon individual

thought and movement through the rights and movements of others. This should be much more pronounced and definite than are any of the legitimate restrictions of the home.

In the games, plays, and group-work the idea of *service* through leadership, and of *being served* through the leader, is also brought to consciousness forcibly. The individual contributes to the social group through his promptness, initiative, and creative effort, and his interests are furthered through the promptness, initiative, and creative efforts of his little neighbors.

Another social factor of much significance is the direction of the energy of the kindergarten children, even through play, toward some definite, tangible end that is in itself worth while. In this manner the children become conscious of value, *pleasure*, in the doing and of value, *worth*, in the deed.

In a larger and more definite sense, the home may be made a topic for special study from the social, the group, standpoint. The factors of the home—father, mother, etc.,—and the activities of the home from the standpoint of service, may be so studied as to lead up to the general idea of a community of interests and of mutual rights and obligations.

This patriotism of the home, loyalty through service, is a fit foundation for the more pervasive patriotism, the more extended service of maturity.

FIRST GRADE

The Carpenter.—What does the carpenter do? What does he do it with? Whom does he do it for? What are his needs? Does his labor as a carpenter produce food, clothing, shelter? How can he produce all of these for himself? What effect will his so doing have upon his efficiency as a carpenter? In what other manner can he obtain food, clothing? What does he give us? What do we give him? What do we get? What do we give?

The dressmaker.—What does the dressmaker do? What does she do it with? Whom does she do it for? What does she need? What does she produce in terms of her needs? How are her other needs satisfied? What does she give? What do we give? What does she receive? What do we receive? How does she make our work easier? How do we

make her work easier? What does she do for us besides making our work easier?

The blacksmith.—Who have seen a blacksmith? Where does he work? What does he do? How does he do it? What does he do it with? Whom does he do it for? What does he do it for? What does he produce for himself? What are his needs? How are they satisfied? What do we receive from him? What do we give him? How are we helped by his work? How could we get along without him? How would it affect us?

The postman.—Consider: what he does; how he does it; whom he does it for; how his needs are satisfied; what his work does for us; how we could do it for ourselves; the inconvenience in time, energy, and money; the significance of his uniform, etc.

The milkman.—Consider his work; what he does; how he does it; whom he does it for; how he serves us; where he gets the milk; how it is kept clean and wholesome; how we could get along without him; the inconvenience, expense, etc.; how his needs are satisfied; how he helps us; how we help him; etc.

SECOND GRADE

The farmer.—Where does the farmer work? What does he do? What does he do it with? Where does he get his tools? Who helps him? How does he help the carpenter? the blacksmith? the milkman? Can he get along without them? Can they get along without him? What would be the effect? How do we affect the farmer? How does he affect us? Can he get along without us? Can we get along without him? What would be the effect? What is our gain through the farmer?

The storekeeper.—Where does he work? What does he do? Name all the things we get from him. Where does he get them? Who helps him? How does he help them? How does he help the carpenter, the blacksmith, the milkman, the farmer? How does he help us? How do we help him? How could we get along without him? How would it affect us? What does he gain through us? What do we gain through him?

The bricklayer.—What does he do? Why does he do it? How does he do it? Whom does he do it for? What does he need?

What does he produce for himself? How are his other needs satisfied? Who satisfies them? Whom does he help? How? Who helps him? How? Why is he so necessary in Salt Lake City? Why is Salt Lake City essentially a city of bricks? What does the bricklayer gain through us? What do we gain through him?

The policeman.—What does he do? Where does he do his work? What is he for? How does he help strangers, the sick, the lost, the destitute? How does he help in crowded places? How does he help at fires? How does he help to protect health? In what other ways does he protect and serve us? How do we serve him? Why does he wear a uniform? A star? Who selects the policeman? What sort of a man do we want for a policeman? How can we help him? What do we gain by having him?

The doctor.—What is he for? What does he do for us? When do we use him? Why? How does he prevent disease from spreading? What does he do to warn others from disease? Why does he report? Why are the cards put up? What has the doctor to do with their removal? When a contagious disease has been in a house, how does he make it safe to live in? How does he prevent the spread of small-pox? How does he help a school? What does he need? What do we do for him? Who helps him to live and do his work? What do we gain through him?

THIRD GRADE

The baker.—Consider: where he does his work; what he does it with; where the materials come from; how they are produced, and by whom; what he does with them; whom he does it for; what his needs are; what needs are satisfied by his work; how other needs are satisfied; whom he is helping, and how; who are helping him, and how; how he helps us; how we help him; our gain through him.

The conductor.—Consider: who he is and what he is for; how he assists us in getting on or off the cars, finding seats, stopping the car at the right place, keeping people from getting off while car is in motion, etc.; what his needs are; how they are satisfied; his hours of labor; significance of uniform; the

kind of man the conductor should be; how we help him in his work; how he helps us.

The motorman.—Consider: his work; how he does it; his hours of labor; how he protects life; his eyes; his habits; his uniform; the kind of man he should be; his service to us; our attitude toward him; how we serve him.

The engineer.—Consider: where his work is done; how it is done; the danger involved; the vigilance required; significance of switch-lights and signals; his eyes; his habits; his hours of service; what we do for him; what he does for us; the kind of man he should be; our gain through him.

The sailor.—Consider: what his work is; how he does it; where he does it; the dangers involved; the kind of man he should be; what he has an opportunity to see and to learn; how we are affected by his work; what his needs are; how they are satisfied; what boys are most apt to become sailors, and why; how the sailor's life benefits us; etc.

The lighthouse keeper.—Consider: location of lighthouses; why so located; purpose of the lighthouse; kinds of lights; how produced; how sailors are warned by the lights; the duties of the keeper; the dangers of; the importance of his work; his loneliness; privations; vigilance; the service he renders, and its importance in terms of human life; the kind of man he must be; etc. Make a specific study of some particular lighthouse and its significance.

FOURTH GRADE

The principal.—Consider: selection of teachers and books; arranging course of study; programming studies, noting progress of pupils and advancing them in their school-work; care of school property; of individual and school rights; health and safety of pupils; proper janitor service, etc; service to the social group.

The teacher.—Consider: what she is for; how she does her work; the preparation she has made; who benefits by what she does; how she is helped—hindered—in her work; whose loss when she is hindered; how hindrance can be avoided; what she has a right to expect; her service to the school group; to the social group.

The janitor.—What does he do? Why does he do it? Why is his work important? What results if his work is neglected? How it may affect us? How is he helped—hindered—in his work? What should be our attitude toward him? Why? What are his needs? How are they satisfied? He exchanges his labor for what? We satisfy his needs for what? What does he gain? What do we gain? Can we get along without him? How would our so doing affect our school work?

The pupil.—What is he here for? By what right? Who makes the privilege possible? What does he give in return? How are those who pay the expenses benefited? Who furnishes the pupil with conditions for his growth? What should be the attitude of pupil toward school property? Why? Toward school books? Toward his own books? Why? How is he helped to make wise use of books and materials? How is the teacher helped—hindered—in doing this? When the teacher's time is taken up with nonessentials, how is the pupil affected? What has a pupil a right to expect from the teacher? What has she a right to expect from him? What factors make a school? What conditions determine growth?

Pioneer life in Salt Lake City.—Consider: choice of location; allotment of land; problem of shelter-material, construction, co-operative effort, effect of co-operation; problem of food—allotment of food brought with pioneers, raising food, tilling soil, planting and care of, harvesting; flocks, how secured, how cared for, how made to contribute to the welfare of all; community effort in terms of food supply; clothing problem—sheep and wool industry, domestic manufacture, co-operative effort, difficulties involved in securing necessaries, effect on industry, on character; irrigation problem—necessity for, irrigation ditches, care of; water master, his service, his compensation, necessity for; method of exchange—its cumbersomeness, dissatisfaction with; discovery of gold and silver; coining money and issuing script as a measurer of values; water problem for homes—how solved; problem of protection—Indians and wild animals—the protecting wall; fire problem—bucket brigade, etc.; amusements and recreations; differentiation of labor—cause and effect; city organization—special systems, means and purpose, growth toward modern city.

GRAMMAR GRADES

In the upper grades the differentiation of labor in terms of group-needs will differ from individual study of lower grades merely in terms of complexity. The spirit that moves, shapes, controls, must be the vital force; not the cold, dead machinery of the social process. The motive is to make a study of social groups functioning themselves in terms of effective public service as a basis for intelligent tax-paying, tax-spending, and a proper understanding of the dignity and responsibility of casting a ballot.

The pupils should be led to see, in the quality of the service, the duties of citizenship in terms of taxpayer, voter, and office-holder.

The psychological value of the study will lie in the formation of habits of perceiving clearly, imaging rationally, remembering acurately, judging wisely, reasoning logically; through which changes will be wrought in the fiber and structure of the brain itself. The matter and method will render children strong or weak; self-reliant or dependent; dynamic factors or passive recipients. We must bear in mind the fact that a broad generalization is reached through a series of painstaking investigations, not by a flippant deduction. It is the end of a series determined by reason, not the beginning, the result of a guess.

This course provides definite lines of investigation, local and individual to the child, but of world-wide sweep to the teacher.

FIFTH GRADE

Police department.—Organization of; officers, how chosen; compensation; qualifications; why so officered; qualification of policemen; how chosen; compensation; daily hours of service; days per week.

Function of department in terms of the social group: (*a*) suppress lawlessness; arrest disturbers of the peace; protect property; protect life; note suspicious characters; assist other cities in suppressing evil-doers; (*b*) guard street crossings; railway crossings; stations; direct strangers; visit sick and destitute; report and relieve; care for sick and injured on public thorough-

fares; note condition of teams and attitude of teamsters; seek lost children or others; report unsanitary conditions and contagious diseases; note condition of streets in terms of safety; assist in guarding life and property at fires; etc.

Significance of uniform and star; of club and gun; secret service men; how helped; how hindered; attitude of mind toward this department as it is; as it ought to be.

The gain to the social group through this department.

Suggestions: Visit police stations, witness drill, and gather all available data at first hand. If possible, have a discussion with the chief of police.

The attitude of mind through this study should be that the policeman is merely an expression of public will, not an enforcer of arbitrary rules. Therefore he is entitled to unqualified approval and support.

Fire department.—Organization of; officers and fire-men; qualifications; how chosen; compensation; significance of organization. Compare and contrast with the police department in terms of qualifications, salaries, daily hours of service, manner of choosing, duties, dangers, service, etc.

Visit fire stations; note organization; drill; make a detailed study of apparatus used; study alarm systems and means of locating fires; number of fire stations and location of.

Consider power to destroy property in case of fire, and on whom conferred; why fire limits and fire districts are established; why buildings must conform to fire ordinances; etc.

Emphasize efficiency of service through differentiated fire-group; contrast with bucket brigades.

Consider fire insurance; the relation of rate and amount to effective service; significance of.

Plat of city locating fire districts and engine-houses.

Consider the gain to the social group through this department.

SIXTH GRADE

Health department.—Officers of; how chosen; salaries; duties; qualifications; health, or sanitary, districts; justification of; inspectors, purpose and duties; quarantine, purpose of; conta-

gious-disease cards, purpose of; birth reports, burial permits, purpose of; means to prevent spread of contagious diseases; regulation of sewage, plumbing, garbage; relation to city prisoners; city poor; public vaccination; why jurisdiction beyond city limits; why reports of contagious diseases; why order buildings disinfected; why condemn buildings, etc.; relation to water supply.

Importance of this department.

Gain, through efficiency, to social group. How helped, hindered, by public attitude toward this department.

Garbage system.—Officers of; how chosen; compensation; duties; garbage districts, location and purpose of; receptacles for garbage; how collected and disposed of; frequency of collection; laws regarding collecting and disposing of garbage; justification of.

Consider: garbage and irrigation ditches; penalties for corrupting waters of irrigation ditches; justification of; laws governing private burning of refuse; justification of; condition of back-yards, alleys; etc.

Gain to social group through this department.

Contrast with health and garbage systems in other cities.

Children should know their own garbage districts, and ought to know the quality of service (*a*) contracted for, (*b*) rendered.

Water system.—The water problem of a large city is literally "a fight for life."

Members of water department; how chosen; compensation; function and duties; why a water system instead of private wells; why public instead of private ownership and control; location of head-waters; how determined; how secured; how controlled; meaning of "water rights;" relation of Liberty Park wells to head-waters.

Means employed to keep water pure; how enforced; how water is brought to the city; the homes; cost of; who pays; location of reservoirs; problem of getting water to upper stories of business blocks. Make a detailed study of the siphon, and apply principle to water system and artesian wells.

Consider special water tax, how adjusted; sprinkling lawns and streets; regulation of irrigation flow; relation of snowfall to water supply.

Suggestions: excursions to head-waters, reservoirs, water office, etc., for data. Consult city engineer; consult city chemist for tests and means taken to preserve the purity of the water supply.

Consider the interrelations of health, garbage, and water systems.

Consider how the social group functions itself through this department, and the social gain through effective service.

SEVENTH GRADE

In this grade the study should become more intensive and extensive in an historical and social sense.

I. Study individual family severing connections with social group, temporarily, and moving into the wilderness. Make a detailed study of problems that arise and of the attempts to solve them.

Consider physical features of new home; climate; plant and animal life; soil; water; rainfall.

Consider equipment in terms of goods; personality; individual and race experience.

Problem of shelter.—Consider site; materials; labor; furniture; barns; roads; protection; defense.

Problem of food.—Consider cultivation of the soil; care of the flocks; division of labor; marketing surplus and contact with the outside world.

Problem of clothing.—Consider raw materials for domestic manufacture; processes of; labor involved; community of interests.

Consider also education of children; religious training; growth of settlement; highway for travel; village problem. (Adapted from Small and Vincent.)

II. Consider primitive mode of city life; lack of organization; no real differentiation of labor; lack of economy and progress in terms of effective service; lack of civic virtue in a large sense; prevalence of plagues; famines; pestilences.

Illustrations: the Black Death; the London Plague; New Orleans and yellow fever, past and present; Havana before the Spanish-American War; Colonel Waring and his white-robed

angels. Port Arthur and the cholera in the late Russo-Japanese War; and others of historical significance that emphasize the point.

III. Modern society contrasted with primitive conditions; social and industrial reasons for the change. Advantage of people serving themselves through differentiated branches of *public service* instead of through a collective service. Disadvantage: the people lose sight of the *functioning process,* hence a corrupt service.

Consider the meaning of one-man power in a democracy: Folk in Missouri; La Follette in Wisconsin; Weaver in Philadelphia; Jerome in New York.

IV. Study of Salt Lake City. The city should be thought of as a social group with specialized functions—we, the people, protecting ourselves through taxes which return to us in terms of public service.

Consider the machinery of the social group, or the mode of organizing different departments with special functions.

Study the city as the social unit within which the special groups find place and meaning. Study it as organizing itself through legislative, executive, and judicial branches.

The *why* of the organizing process should be kept vividly in the foreground at all stages of the development of the subject.

Consider the organization of the city into municipal wards, and the manner in which each ward functions itself in terms of city government; how the ward is represented in the city council; how councilmen are chosen; term of office; duties; salary; function; why represented by wards instead of by city as a whole? why not two branches, by city and by ward? Function of council as a whole; why not initiative and referendum? What gain to the social group through functioning itself through the city council?

Consider the chief executive; how chosen; when; term of office; salary; why greater than councilman's; duties in general; executive, legislative, appointive power; relation of mayor to the city council; significance of office.

Consider judicial branch in similar manner.

Consider interrelations of various departments and the gain of the social group through them.

Taxes.—Consider: how funds for supporting the different departments are secured; justification of; why tax all? Apportionment of taxes; collection of taxes; who should see that the taxes are properly expended and why? In the study of taxation the children should see again through form to content; should see that the taxpayer, through taxes, merely hires someone to look after his share of interest in the general welfare; should see that his responsibility as a member of the social group does not end with the payment of taxes, but that it is also his duty to see that the same are wisely, effectively, and economically expended. In short, through the study the children should lay a foundation for intelligent tax-paying and tax-spending.

EIGHTH GRADE

Paving.—Consider: kinds of material—asphalt, macadam, brick, blocks, etc.; what governs choice; residence districts; business districts; compare with other cities; relative cost; durability; access to material; water vs. oil for street-dressing; cost, durability, sanitary effect, etc.

Consider the significance of the "good roads" movement. Consider the "road" movement from the standpoint of history. Contrast Greece and Rome in terms of roads, and their effect on national life. Significance of, "All roads lead to Rome."

Consider the municipal-ownership movement, its purpose and significance. Study effects of, in London, Glasgow, Birmingham.

Consider government control of public utilities. (The children of the eighth grade won't settle this question, but, as many do not go beyond this grade, they should have an intelligent appreciation of its significance.)

County organization.—Consider: genesis of; legislative, executive, judicial departments; officers of; how chosen; compensation; duties; public service rendered; social gain through county organization.

State organization.—Consider: officers in various departments; how chosen; term of office; compensation; duties; ser-

vice rendered; social gain; relation of city and county to; relation of state to nation.

Industrial development.—Consider the industrial development from the adoption of the Constitution of the United States to the present day. Trace development through home and factory from local area to world-markets. Consider: our present supremacy; coal and iron as factors; probable effect of Panama Canal; competitive forces; world-service vs. individual gain.

Army and navy.—Consider: organization of; cost; function; non-productiveness of; necessity for. Contrast with England, France, Germany. Cost of war in men and money.

TEACHERS' READING COURSE ALONG SOCIOLOGICAL LINES

Nash, *Genesis of the Social Conscience;* Henderson, *Social Spirit in America,* and *Social Elements;* Small and Vincent, *Introduction to the Study of Society;* Small, *General Sociology;* Giddings, *Principles of Sociology;* Horne, *Philosophy of Education;* Thurston, *Economics and Industrial History;* Gibbins, *Industry in England;* McVey, *Modern Industrialism;* Arnold, *Culture and Anarchy,* and *Essays on Democracy;* Ruskin, *Crown of Wild Olive,* and *Open Sesame;* Emerson, *The American Scholar.*

FICTION DEALING WITH SOCIAL PROBLEMS

Dickens, *Hard Times;* Reade, *Put Yourself in His Place;* Kingsley, *Alton Locke* and *Yeast;* Eliot, *Felix Holt;* Hugo, *Les Misérables* and *Toilers of the Sea;* Mrs. Humphrey Ward, *Marcella;* Besant, *All Sorts and Conditions of Men;* Allen, *The Reign of Law;* Elizabeth Stuart Phelps Ward, *The Singular Life.*

Typical poems, articulating the cry of the social spirit, may be found worthy of study, such as:

Elizabeth Barrett Browning, "The Cry of the Children;" Tennyson, "Rizpah," "Despair," and " Locksley Hall Sixty Years After;" Whittier, "Massachusetts to Virginia;" Lowell, "The Present Crisis;" Lanier, "The Symphony;" Whitman, "Song of the Open Road;" Markham, "The Man with the Hoe," "The Toilers," and "Brotherhood."

BIOGRAPHIES FOR CHILDREN IN GRADES

John Howard, Elizabeth Frye, Florence Nightingale, Peter Cooper, Frances E. Willard, George Waring, Governor Folk, Governor La Follette, William Travers Jerome, Mayor Weaver.

The author ackowledges his indebtedness to Mr. Henry W. Thurston for insight into, and interest and inspiration in, this phase of school work.

CULTIVATE CHILDREN LIKE FLOWERS

LUTHER BURBANK

Which has the more influence in building the life of a child, heredity or environment? And are acquired characters inherited?

My own observations prove that all characters that are inherited have once been acquired, and that heredity is only the sum of all these past environments, which, if impressed on the heredity long and strong enough in any specific direction, will become part of heredity itself, and this new heredity, already slightly changed by these late environments, will have to meet new environments as before, which will, by repetition, become fixed in the ever new and constantly fluctuating heredity.

Did you ever think what is the most pliable and the most precious product of all the ages? It is not pigs, mules, books, or locomotives, cotton or corn—but children.

Children cannot all be treated alike; each has his or her special individuality, which is the most valuable of all endowments. If all were alike, no progress could be made and right here comes the weakest point in the present educational systems.

I have long been studying the intricate complexity of the action of heredity and environmental forces on life, both in plants and in man, and these comparisons and deductions came clearly, sharply, and naturally. It has been said that to improve a child we should begin with the grandparents. This is only a half-truth, which perhaps had better never have been said. Do not waste any of your time on grandparents unless you commence on them in earliest pliable childhood. If we hope for any improvement on the human race, we must begin with the child, as the child responds more readily to environment than any creature in existence. The change may come in the first generation, and it may not. It may not show at all for many generations, but patience and constant attention will finally be rewarded

in the survival of the most beautiful, the most precious, or the fittest, whichever you may wish to call it.

In child-rearing, environment is equally essential with heredity. Mind you, I do not say that heredity is of no consequence. It is the great factor and often makes environment almost powerless. When certain hereditary tendencies are almost indelibly ingrained, environment will have a hard battle to effect a change in the child; but that a change can be wrought by the surroundings we all know.

A child absorbs environment. It is the most susceptible thing in the world to influence, and if that force be applied rightly and constantly when the child is in its greatest receptive condition, the effect will be pronounced, immediate, and permanent. There is no doubt that if a child with a vicious temper be placed in an environment of peace and quiet the temper will change. Put a boy born of gentle white parents among Indians and he will grow up like an Indian. Let the child born of criminal parents have a setting of morality and decency, and the chances are that he will not grow up to be a criminal, but an upright man.

I do not say that heredity will not sometimes assert itself, of course. When the criminal instinct crops out in an individual, it might appear as if environment were leveled to the ground, but in succeeding generations the effect of higher environment will not fail to become fixed.

We in America form a nation with the blood of half the peoples of the world in our veins. We are more crossed than any other nation in the history of the world, and here we meet exactly the same results that are always seen in a much-crossed race of plants; all the worst as well as all the best qualities of each are brought out in their fullest intensity, and right here is where selective environment counts.

All the necessary crossing has been done, and now comes the work of elimination, the work of refining, until we shall get an ultimate product that will be the finest human race which has ever been known. It is perhaps this country which will produce that race. Many years will pass before the finished work is attained, but it is sure to come. The characteristics of the many

peoples that make up this nation will show in the composite, with many of the evil characteristics removed, and the finished product will be the race of the future.

In my work with plants and flowers, I introduce color here, shape there, size, or perfume, according to the product desired. In such processes the teachings of nature are always followed. Its great forces only are employed. All that has been done for plants and flowers by crossing, nature has already accomplished for the American people. By the crossing of bloods strength has, in one instance, been secured; in another, intellectuality; in still another, moral force. Nature alone could do this.

Man has by no means reached the ultimate. The fittest has not yet survived. In the process of elimination the weaker must fall, but the battle has changed its base from brute force to mental integrity.

Statistics show many things to make us pause, but after all the proper point of view is that of the optimist. The time will come when insanity will be reduced, suicides and murders will be fewer, and man will become a being of fewer mental troubles and bodily ills.

Wherever you have a nation in which there is no variation there is comparatively little insanity or crime, or exalted morality or genius. Here in America, where the variation is greatest, statistics show a greater percentage of all these variations.

As time goes on in its endless and ceaseless course environment will crystallize the American nation. Its varying elements will become unified, and the weeding-out process will probably leave the finest human product ever known. The color, the perfume, the size and form that are placed in plants will have their analogies in the composite, the American of the future.

And now, what will hasten this development most of all? The proper rearing of children. Don't feed children on maudlin sentimentalism—give them nature. Let their souls drink in all that is pure and sweet. Rear them, if possible, amid pleasant surroundings. If they come into the world with souls groping in the darkness, let them see and feel the light.

Don't terrify them in early life with the fear of an after-

world. Let nature teach them the lessons of good and proper living, combined with an abundance of well-balanced nourishment. Those children will grow to be the best men and women. Put the best in them by contact with the best outside. They will absorb it as a plant does the sunshine and the dew.—*Chicago Tribune.*

SOCIAL ACTIVITIES IN THE FIRST GRADE OF THE FRANCIS W. PARKER SCHOOL

ROSE B. PHILLIPS

At the beginning of the fall term three social needs presented themselves to the first grade:

1. The making of a Christmas gift for home.
2. The planning of a pleasing curtain for our dressing-room.
3. Making candles for the kindergarten Christmas tree.

I. A CHRISTMAS GIFT

Plants to blossom indoors, and to blossom preferably at Christmas time, were chosen for gifts. After looking at flower catalogues, we decided that freesias and jonquils were best suited to our purpose. The children filled low four-inch bulb-pots with sandy loam from a field near the school, first putting in a small stone or two for drainage. Each child planted in his pot five of the kind of bulb he preferred. To make the gift a more complete one, we decided that bowls of clay should be made to hold the pots and plants.

The following reading-lessons, which were first written on the board by the teacher as the children told each step of the process, give an account of the work. These reading-lessons, with a kodak picture of the bowls and plants, and two working-plans of the bowls, made by each child for his use in the clay-room, were tied between stiff paper covers, as a book to accompany the gift.

FIRST-GRADE READING LESSONS

MOTHER'S CHRISTMAS GIFT

In October we planted some freesia bulbs.
We planted jonquil bulbs, too.
These may blossom by Christmas.
They are for our mothers' Christmas gifts.

THE PLANTING

We planted our bulbs in flower-pots.
The pots are four inches wide.
They are two inches high.
We put stones in the bottom of the pots.
What was that for?
We filled the pots with sandy soil.
We planted the bulbs one inch deep.

PUTTING BULBS IN THE DARK

We put our bulbs in a dark place.
This was to let the roots grow.
Strong roots help to make strong plants.
The light makes the leaves grow well.
At first we watered the bulbs well.
The soil stayed damp.
We did not water them again.
We left them in the dark place for twelve days.

GROWTH IN THE DARK

We brought the plants from the dark.
We held them upside down.
We took the pots off.
We could see many roots.
They were all through the soil.
We put the plants into the pots again.
The freesia leaves were two inches high.
The jonquil leaves were one inch high.
The leaves were white.

PUTTING PLANTS IN THE LIGHT

We first put the plants in a dim light.
We watered them.
We left them there for two days.
Then they could bear sunlight.
We put them in a sunny window.
The leaves turned green.
We water them often now.
Look at this picture.
It shows how our plants look now.
The taller ones are the freesias.

ANOTHER PART OF MOTHER'S CHRISTMAS GIFT

We are making dishes of clay.
The bulb-pots will be put into the dishes.
The dishes will be five inches wide.

They will be two and one-half inches high.
They will be dried.
They will be baked in the kiln.
They will be glazed.
They will be baked again.
The color will be light green.

II. THE DRESSING-ROOM CURTAIN

The entrance to our schoolroom has a dressing-room on one side, and a cupboard with glass doors on the other. The dressing-room has no door, the cupboard no curtains. To make this entrance more attractive was what we wished to do. Curtains for each place was the suggestion of most of the children, and was the only feasible one. Tan-colored linen was being used elsewhere in the school, and this was shown to the children. They liked it. We went to the eighth-grade room to see curtains of linen which the eighth grade had stenciled with pine trees. The first grade thought it would be nice to decorate their curtains in such a way.

We went to Lincoln Park to see what suggestions for decorations might offer themselves there. The park was beautiful that morning, and rich in suggestion. Beautiful leaves were picked up, and one of the park gardeners gave generously of flowers and curious seed-pods, as a result of his pruning in "Grandmother's Garden." We made several trips to the park, the school garden, and to fields near by. The children painted and drew trees, flowers, seeds, and vegetables. They then decided that leaves would make the nicest decoration for the curtains.

FIRST-GRADE READING LESSONS

THE DRESSING-ROOM CURTAIN

Our dressing room has no door.
All who come into our room pass the dressing-room.
We thought it needed curtains.
Tan linen was bought for the curtains.
We decided to decorate them with leaves.

CUTTING PATTERNS

We cut patterns of oak, maple, poplar, and willow leaves.
We pinned the patterns on a curtain.
We liked the oak patterns best.

CHOOSING THE COLOR

We had to choose the color for the leaves.
Leaves out-of-doors were red, green, and yellow.
We cut leaves of green and yellow paper.
We had no red paper of the right shade.
We pinned the yellow and green leaves on the curtain.
We chose the green for our leaves.

THE ARRANGEMENT OF LEAVES

We did not know how to arrange the leaves.
Each played a sheet of paper was a curtain.
With green crayon each arranged leaves on the paper.
We chose Adrian's arrangement.
You may see it on our curtain.

MAKING THE STENCIL

A stencil was cut from one of the oak-leaf patterns.
The stencil was cut in heavy, brown paper.
The paper was shellacked on both sides.
This was done to keep the color from passing through.
We painted the leaves on the curtain with green dye.
The dye was boiling while we painted.

III. CANDLE-MAKING

The first thing to do was to choose the material of which the candles were to be made. Wax, paraffin, spermaceti, stearin, and tallow were shown to the children. Spermaceti and stearin were excluded on account of expense. To help in making a choice of paraffin, wax, or tallow, candles of each of these materials were burned. The paraffin flame was the largest, and that material was the one chosen.

How to make the candles was the next question. One of the boys said his father had read to him of boys making candles in bamboo canes. This idea was quickly taken up by the children and modified in various ways.

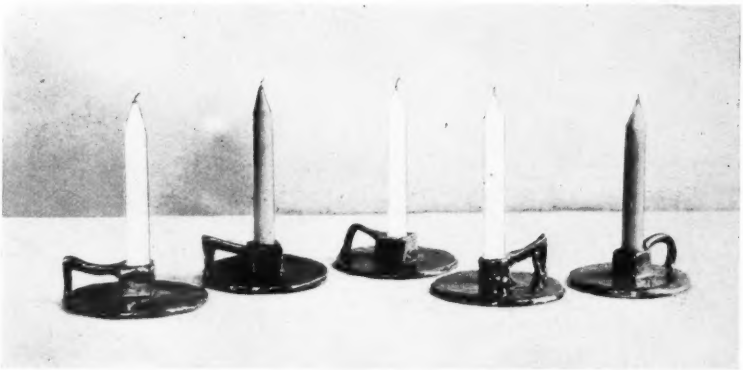
The children were asked to work out their plans at home. The result was candles made in five different ways.

One was made in a paper mold. A piece of heavy paper had been wrapped around the handle of a duster and the edges of the paper glued. Darning-cotton was used as a wick and the tube stood upright in a low tin can, being held in place by

PLANTS AND CLAY BOWLS FOR "MOTHER'S CHRISTMAS GIFT"

CURTAIN SHOWING STENCIL DESIGN—FIRST GRADE

DIPPING CANDLES FOR THE CHRISTMAS TREE



CANDLESTICKS AND MOLD CANDLES FOR VALENTINE GIFTS—FIRST GRADE

paraffin that had solidified around the tube. Paraffin was poured into the mold—the mold, of course, having to be broken to release the candle. Another was made in a bottle, and another in a wooden mold.

A wooden mold was made from a block $7 \times 2 \times 2$. A half-inch hole was made lengthwise, almost through the block. The block was split, and the two pieces fastened together with hinges and a clasp. (Help had been given in putting on the hinges and clasp.) A piece of string was used for the wick.

Another candle was made by dipping a piece of string in and out of wax repeatedly; another, by rolling paraffin, partly warm, around a string.

We liked the size and appearance of the dipped candle, and thought, too, that it was the easiest of the five ways shown for making candles; so it was decided to make the Christmas-tree candles by dipping.

Five pounds of paraffin were melted. Three wicks were tied to each of two sticks, nails being tied to the wicks to make them sink easily into the paraffin. These nails were cut off as soon as the paraffin stiffened the wick. Two dozen candles were made in this way.

The children thought they would like to make candles for home, so we planned to make larger candles, and candle-sticks of clay to fit them, as Valentines or Easter gifts.

The children were shown some tin candle molds. These they thought would make nice candles of just the right size. To the paraffin for these candles was added some stearin to make them harder. A candle made of paraffin alone will bend in a warm room.

The children drew plans for their candlesticks. They were then shown some simple candlesticks of good design, and their second plans were better.

Many wished that the candles might be colored. Green is the only color we have managed successfully. This is made by dissolving green and yellow aniline dye in stearin.

The candlesticks for the green candles were glazed green; for the white candles blue.

CAN THE COLLECTING INSTINCT BE UTILIZED IN TEACHING?

ELIZABETH HOWE

The collecting instinct seems to arise in the majority of children; comparatively few have never collected. Is it not possible, since this habit seems to be almost universal, to develop this instinct along certain lines in schools?

Dr. G. Stanley Hall, Professor Earl Barnes, and Mrs. C. F. Burk[1] have made investigations on the collecting instinct of children, and have found it to be very common. So far as known, the public schools as yet have not recognized the value of this instinct. My investigation was along the same line as that of the above writers, and the results in the main agree.

Dr. Hall says: "The habit could be put to great advantage; that is, to collect scraps on literature, geology, etc. Children gather blindly, with no knowledge of the geography of the country from which the stamps come, nor the species of birds which lay the different eggs collected." With the knowledge confronting us that this instinct does commonly exist, two questions arise: first, What are the principal varieties of this collecting instinct? and, second, What varieties can be utilized to advantage? Investigators have tried to solve the first by having a group of children write answers to a number of questions; but, of course, there is one great fault to be found with the questionaire method, because when a teacher asks questions of her pupils, there is a tendency for them to give what they think the teacher wants. This was so to some extent in the papers from which I got my data.

The ideal method for finding out the individual instincts would be to take each child separately, and find out from him

[1] G. S. Hall, *Pedagogical Seminary*, Vol. I, p. 234; Earl Barnes, *Studies in Education*, Vol. II, p. 144; C. F. Burk, *Pedagogical Seminary*, Vol. VII, p. 179.

in an unguarded moment the things he collected and the reason for doing so. This method would take time and trouble, which probably could not be given by the average school-teacher.

Nevertheless, it is quite clear that the teacher who had such information would have an insight into the children's inner life which she would hardly be able to get in any other way. It would bring out some of the desires of a child which the teacher could encourage or check.

The following list of questions was asked of 135 pupils, from eleven to seventeen years old, belonging to the sixth, seventh, and eighth grades of a school situated in a very much congested district of Chicago:[2]

1. Tell all the things you have collected.
2. How old were you when you began?
3. Have you stopped? If so, how old were you at that time?
4. Why did you begin?
5. If discontinued, why have you done so?
6. Tell the number in each collection.
7. Did you arrange the things collected? If so, how?

Of the 135 there were 17 who did not understand the meaning of the word "collection" and fourteen who had made none. This leaves 104 papers from which I have drawn my conclusions. Of this 104, 52 were boys and 52 were girls. Forty-six different things were collected by boys and 45 by girls. The interests of the girls as a whole seemed more trivial than that of the boys, although this might not be true if a larger number were considered.

The following is a list of the things collected:

BOYS			
Books	20	Buttons	2
Stamps	8	Papers	2
Money	7	Electrical things	2
Pictures	5	Pins	2
Pencils	4	Pens	2
Old and foreign money	4	Cord	
Stones	3	Coal with iron in it	
Marbles	3	Blank checks	
Railroad folders and time-tables	5	Tools	
Photographs	2	Brushes	
		Magazines	

[2] Through the kind interest of Mr. Joseph A. Bache.

Bibles
Music-books
Outcast animals
Bats
Balls
Footballs
Drawing-paper
Paints
Neckties
Scarf-pins
Tickets
Tops
Twigs and branches
Shoe-laces
Coupons
Spelling-papers
Boxes
Rulers
Notes
Seeds
Flag buttons
Departments of government
Articles made in manual training

GIRLS

Books	19
Pictures	11
Stamps	7
Postal cards	5
Dolls	5
Ribbons	4
Notes	4
Money	4
Photographs	4
Souvenirs	3
School papers	3
Shells	3
Spoons	2
Flowers	2
Handkerchiefs	2
Old and foreign money	2
Cups and saucers	2
Songs	2
Drawings	2

Rags
Marbles
Arithmetics
Magazines
Receipts
Railroad maps
Plates
Calling-cards
Sunday-school papers
Sheet music from Sunday *American*
Turfs from Ireland
Paper
Chalk
Pens
Pencils
Time-tables
Birds' wings
Berries
Corn
Stones
Tubs
Desks
Leaves
Pocket-books
Fancy-work
Music

Collections of books were made more often than any other thing. This is true both of the boys and of the girls. In Dr. Stanley Hall's investigation he found that stamps were collected more often than anything else; in that of Earl Barnes, buttons and picture cards; in that of Mrs. Burk, nature interest ranks the highest. These observations seem to show that the things which interest children most are different in different localities. As Mrs. Burk's children all live in California, where flowers and

plants are more common than here, it is barely possible that this would explain their preference for nature.

The reasons for collecting are interesting. Things were collected, in the majority of cases, without any thought of value, but apparently, first, simply to own something, and, second, to increase the quantity of that something. Nine wanted to see how many they could get; eight collected for remembrance; eight, because it was right or they were told to do so; seven collected books because they wanted to read; six collected, but did not know why; three, to see how much money they could save (not for its value at first). The other reasons stated were "amusement," "curiosity," "interested," "ornamental," "useful," and some "because they liked to do so." One boy collected bats and balls because as he said: "I got crazy over playing ball;" another collected electrical apparatus because he thought it would be good as a trade. Another boy began to collect things so as to have something to leave to his brothers and sisters.

Earl Barnes states that he found emulation to be the reaosn given for collecting in 22 out of 128 cases; and a curious thing is that not one of the children in the group I had gave evidence of having had emulation or imitation as a motive. None said anything about color or beauty, but quantity was their special aim.

In Dr. Hall's paper he gives "marbles" as one of the first on the list, while comparatively few of my children collected them. One girl has 579 and is still collecting them. She is now sixteen years old and started her collection at the age of ten.

Out of the 104 who made collections, 77 are still collecting; 27 have stopped. Twenty-seven commenced to collect at the age of ten years, 36 after they were ten and 41 before they were ten. There were a few who started as early as the fifth year. Forty-eight of the children are now fourteen or over, and 56 are under fourteen years. Some of these who are now collecting are fifteen and sixteen.

Of the 52 girls who made collections, 30 had schemes of arrangement, and 22 did not. One arranged her postal cards according to the months, to see how many she received in each month; one held each kind of examination papers together with a rubber band; another put books on a shelf according to the men and women who wrote them; and another put her leaves and flowers in a book made for that purpose.

Twenty-four boys made no arrangement, and 28 did. The one who collected buttons arranged them in the form of a crescent and hung them on the wall. The stamps of one boy were arranged in a book according to their value; another arranged them in an album according to the country to which they belonged; another one put his United States stamps in packages of 100 each, and the foreign ones he pasted in a book. One boy arranged petrified animals according to the family in which they belonged; another arranged his books by numbering them with a paper and putting them in a bookstand. A considerable number stated that they had arranged their collections so that they could find them.

This investigation has shown that there were almost as many different kinds of things collected as there were children to collect them. It might seem at first that, on account of this great diversity of interest, it would be almost a hopeless task for a teacher to try to direct these young ideas into proper channels. On further study, however, it will be noted that many of the things collected can easily be divided into a few groups. For example, we could put under the head of "educational" the collections of books, minerals, electrical apparatus, paints, leaves, branches, flowers, etc.; under the head of "remunerative," money, possibly coupons and stamps, etc.; under "æsthetic," pictures, neckties, scarf-pins, souvenirs, shells, fancy-work, etc.

This paper has been written with a view to raising the question as to how the collecting instinct can be utilized in teaching. But first of all it is very desirable to learn of instances in which it has already been utilized. The writer would be grateful for answers to the following questions:

1. Have you ever made any use of the collecting instinct of children in your teaching?

2. What methods of enlisting and developing the instinct were used.

3. What results were obtained?

Answers to these questions may be sent to

ELIZABETH HOWE,
Care of *Elementary School Teacher,*
School of Education.

ANIMAL COVERINGS: FROM THE STANDPOINT OF THE TEXTILE WORKER

ROBERT W. HEGNER
Zoölogical Department, University of Chicago

The material in the following paper was originally prepared for the college class in textiles at the School of Education. It was considered of sufficient value to place before other teachers, not only as an aid in textile work, but also as a means of increasing the points of contact between the child and the lower animals, thus fostering a natural love and sympathy for the creatures that live out of doors.

Before we can consider in logical order the various facts of animal coverings, we must have some knowledge of how the animal kingdom has been divided into groups, classes, etc. Zoölogists recognize a number of groups, or phyla, of animals, which they have arranged, according to their complexity and supposed relationships, into a series beginning with the one-celled forms and ending with the genus *homo*. At one point in their classification, a new character, the backbone, appears, which is so important that the whole kingdom is often divided primarily into two large assemblages, namely, those with backbones, and those without backbones. A simplified form of the classification employed by prominent scientists is given below:

GROUP A. *INVERTEBRATA (ALL ANIMALS WITHOUT BACKBONES)*

Phylum 1. *Protozoa* (one-celled animals, mostly microscopic).
Phylum 2. *Porifera* (sponges).
Phylum 3. *Coelenterata* (jellyfish, coral, etc.).
Phylum 4. *Platyhelminthes* (tapeworms, etc.).
Phylum 5. *Echinodermata* (starfish, sea urchin, etc.).
Phylum 6. *Annelida* (earthworm, leech, etc.).
Phylum 7. *Mollusca* (clam, snail, cuttlefish, etc.).
Phylum 8. *Arthropoda* (crayfish, insects, spider, etc.).

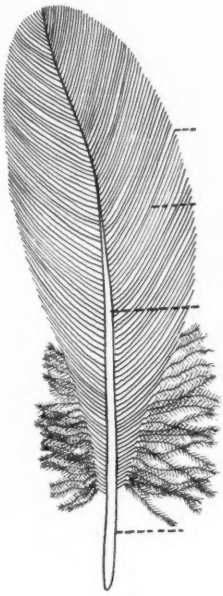


FIG. 1

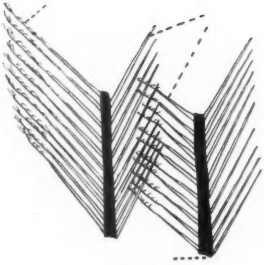


FIG. 2

FIG. 3

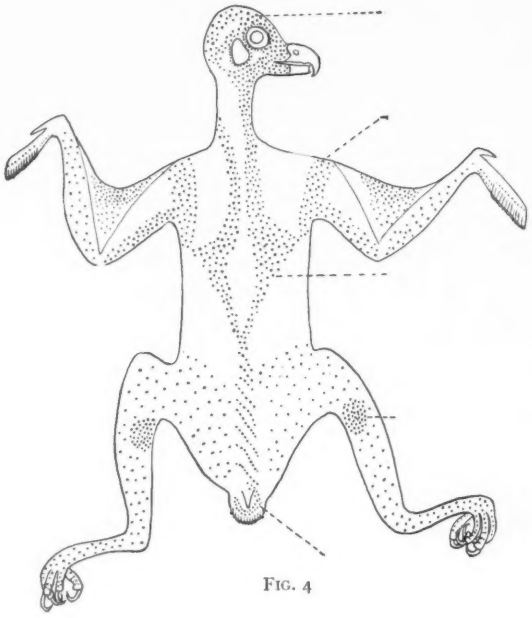


FIG. 4

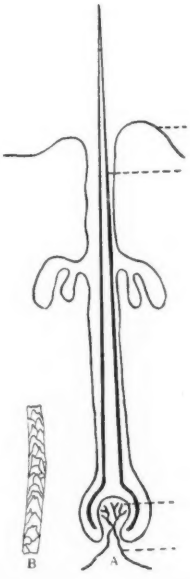


FIG. 5

GROUP B. *VERTEBRATA (ANIMALS WITH BACKBONES)*

Phylum 9. *Vertebrata.*

It is necessary for our purpose to divide the last phylum into its five classes, giving the characteristics that separate each class from the others.

PHYLUM *VERTEBRATA*

Class 1. *Pisces.* (Animals with backbones that spend the whole of their lives in the water. They are usually covered with scales, possess fins instead of jointed limbs and fingers, and breathe by means of gills.)

Class. 2. *Amphibia.* (Vertebrates that spend part of their lives in the water and part on land. They are usually without scales, and breathe by means of lungs.)

Class 3. *Reptilia.* (Vertebrates, usually covered with scales, that breathe by means of lungs.)

Class 4. *Aves.* (Vertebrates with a covering of feathers.)

Class 5. *Mammals.* (Vertebrates possessing mammary glands from which they feed their newly born young. They always have hair on their bodies.)

A fact of interest to us is that these five classes just outlined are distinguished from one another by the *nature of their coverings.* Thus no animal except a mammal has hairs on its body; only birds have feathers; only reptiles have scales and also lungs; only amphibians have naked skins; and only fishes have scales and also gills. This, of course, is only a superficial examination, and there are rare exceptions in each of the above groups. The natural classification depends on the skeleton and other structures that are of more importance, and do not vary as greatly as does the external covering.

The coverings of animals serve various purposes. (1) They prevent serious injury from ordinary accidents, (2) they keep the natural warmth of the body from escaping, and (3) by their colors they protect the animal from its enemies.

The first benefit derived from the coverings need take up little of our space, for it is perfectly obvious how valuable hair, feathers, scales, and shells are to their owners as a protection from injury. We may, however, draw a comparison between these coverings and our own clothing, which gives us a similar immunity from accidents. Shoes, hats, gloves, the headgear of

football players and many other articles of apparel are donned expressly to escape injury. In southern warm climates the shoes are reduced to sandals, and hats to sunshades, and in the daytime all clothing becomes a refuge from the burning rays of the tropical sun, while at night it serves to shield the body from the dew and chilly winds.

In considering the second benefit, that of warmth, we must exclude all cold-blooded animals. All invertebrates, fishes, amphibians, and reptiles, are cold-blooded; that is, the temperature of their bodies is generally only several degrees higher than their surroundings. Only birds and mammals then come under discussion here. Birds have a temperature up to 112°F. This is higher than that of man, which is normally 98.3-5°F. It is evident that these animals must have some means of keeping this warmth in their bodies, and this is accomplished by their coverings.

The feathers of birds are remarkable structures, and no organs like them are possessed by other animals. The structure of feathers is very interesting. An ordinary one (Fig. 1) has for its central support a main *stem,* on each side of which is a *vane.* The part of the main stem free from the vane is called the *quill;* the remainder is called the *shaft.* The vane is composed of a number of *barbs* (Fig. 2). Each barb bears smaller structures called *barbules* (Fig. 3) on either side causing it, when viewed under a microscope, to resemble an entire feather. These barbules in turn, in many cases, notably the large wing and tail feathers, carry on their anterior surface—that is the surface toward the tip of the feather—small *hooklets* (Fig. 3). This complete structure is remarkably well adapted for an aërial life. The barbules of one barb overlie those of the preceding barb, forming a diagonal mesh-work (Fig. 2). Each hooklet of one barbule catches in the barbule from the next barb in front, thus further increasing the interlocking. The result is an extremely strong and resistant, though pliant, mechanism—just such as is necessary for the use of the bird in flying.

In the majority of birds there are two kind of feathers. The large ones with vanes are called *contour feathers,* and the small

fluffy ones are the *down feathers.* Both kinds lie in sacs in the outer layer of the skin, the *epidermis.*

Just at the base of the rudimentary tail, or "pope's nose," is a gland that secretes an oil. When the bird presses a drop of oil with its beak and dresses its feathers, it is said to be pruning. It is very difficult to wet a bird's feathers, and, as everyone knows, the aquatic birds—ducks, gulls, etc.—can remain in the water indefinitely without any disasters. The oil aids the feather in shedding water, just as a raincoat does for us, and when a bird "prunes" it is simply putting on its waterproofs.

Feathers do not occur over the entire body of a bird, but are restricted to certain tracts caled *pterylae.* The illustration (Fig. 4) shows the feather tracts on the back of a great horned owl.

All birds change their feathers frequently. The young, when newly hatched, are either naked or covered with down. They soon outgrow this, just as young children outgrow their clothes, and in the course of a week or two true feathers begin to appear, and all that remains of the down are a few spots where the baby clothes still show through the contour feathers. The first plumage is worn only a short time; then it gives way to a second plumage. The loss of one set of clothing and the acquirement of another is called "molting." In adult birds molting is annual or semi-annual. All birds shed their feathers in the autumn, after they have finished their household duties for the season, and put on their heavy woolen winter clothing in the shape of a beautiful new set of plumage. In the spring there are many birds that do not consider their ordinary clothes good enough in which to do their wooing; so they change again, and at this time acquire the gorgeous ornaments that are everywhere noticeable just before the breeding season, such as the elegant plumes of the snowy heron, known as "aigrettes."

A much-disputed theory which attempts to account for the beauty of the feathers of male birds at the breeding season is that called "sexual selection." The females are supposed to be attracted by the most brightly colored males, and select them for their mates, the result being that more beautiful males have been

bred generation after generation, until by sexual selection the present strikingly ornamental effects have been produced; for example, the birds of paradise, lyre birds, humming birds, etc.

The characteristic covering of mammals is hair. This is undoubtedly extremely well fitted to keep the possessor dry and warm; for humans are ever ready to take the beautiful fur away from them to make coats, boas, muffs, etc., for themselves. Hairs are much simpler in their structure than feathers. They arise from sacs in the epidermis (Fig. 5). Each hair has at its base a papilla, which contains nerves and blood-vessels, and from which a new hair grows if the old one is destroyed. At the sides of the sac are sebaceous glands, which serve to oil the hair and keep it pliable.

Fur is generally composed of one kind of hair; but some animals possess two kinds: (1) long, coarse structures scattered over the body, but not so numerous as (2) the finer underfur. The fur seals are thus covered. Many modifications are found in hairs on different parts of mammal bodies. The long hairs on the tails of horses, the eyelashes of man, the sensitive hairs on the snout of the cat, the spines of hedgehogs and porcupines, are all modifications.

The most useful and most important of all hairs is that found on the sheep, called wool. The fiber of wool is more or less waved. It is a "peculiar modification of hair characterized by fine transverse or oblique lines from 2,000 to 4,000 in the extent of an inch, indicative of a minutely imbricated surface" (Prof. fessor Owen; Fig. 55). These serratures interlock firmly when the hairs are twisted together, and give to wool its felting quality.

In most mammals there is a periodic shedding and renewal of the hair, the new hair arising from the old papilla. This usually occurs in the spring. Low temperatures seem to stimulate the growth of hair, as we find the coats of horses becoming thick and woolly in autumn, and the wool of arctic animals is heavier than that of like creatures found in warm climates.

There is a seasonal change in the colors of certain mammals. The polar hare and the arctic fox show this to a remarkable

degree. In them the hair becomes pure white in the winter. This, of course, makes them inconspicuous against a background of snow, and helps them escape the sharp eyes of enemies. "In the case of Ross's lemming, we know that this change is due to the influence of the cold, and depends in great part on the appearance of gas bubbles inside the hairs" (Thomson).

The value of color in nature, our third topic, cannot be overestimated. Large volumes have been written regarding the various benefits derived from advantageous colors, and indeed the very lives of most animals depend on their power to conceal themselves amid their surroundings so effectually as to escape their enemies. Obviously only the principal and most easily explained phenomena can be considered in this paper.

Color is caused by white light being broken up into its various wave-lengths. When an object appears black, it is because it has absorbed the entire complex of white light. When an object appears red, it has absorbed all the elements of white light except the red wave-lengths, which are reflected and make an impression on our eyes. Colors have been divided into (1) structural and (2) pigmental. The former occur to perfection in the gorgeous raiment of birds and butterflies. The changeable colors seen on humming-birds, on the neck of the pigeon, and on numerous other birds are optical effects due to modifications of the feather structure. The exact physical causation of the colors is unknown. Pigmental colors are due to the presence in the organism of substances of definite chemical composition that react to light always in the same way. The green color in plants is a good example. It is due to a pigment called chlorophyll that acts when extracted from the plant body exactly as when within the tissues.

Poulton, in his book on *The Colors of Animals,* gives in concise form the uses of color, and later gives a full explanation with examples under each.

I. NON-SIGNIFICANT COLORS.—These are colors that are due to chemical or physical structure, valuable to the animal not because of their color itself, but because the organs that contain it are of value. For example, blood is red and fat is white.

II. SIGNIFICANT COLORS.

1. *Colors of direct physiological value.*—Included under this head are those colors that are of importance in retaining and giving off heat. Dark colors readily absorb radiant heat, and light colors do not. For this reason black clothes are the warmest in hot weather and white most comfortable. This may account for the change of colors at different seasons of the year. However, a dark surface readily parts with heat, while a white surface tends to retain heat, and this may be a factor in the coloration of animals. For example, the white appearance of arctic birds and mammals must be advantageous for concealment in a region so largely covered with snow, but it is very probable that advantage is also secured by checking the loss of heat through radiation.

2. *Protective and aggressive resemblance.*—An animal is *protectively colored* when it resembles its natural surroundings in such a way as to elude its enemies. Almost all animals are thus protected, familiar examples being the insect known as the walking stick, which so closely resembles a twig as to be practically invisible among the branches of trees; and the owlet-moths belonging to the genus *Catocala,* which are safe from discovery while resting on the bark of trees. *Aggressive coloration* is possessed by animals that resemble their surroundings so closely that they can steal upon their prey unseen. This style of coloration is found in many snakes, lizards, etc., whose skins harmonize with their habitat and enable them to get close to their victims.

3. *Protective and aggressive mimicry.*—In this case the animal gains advantage by superficial resemblance to some other form. *Protective mimicry* occurs when one animal resembles another which is immune from attack from other animals because of its sting, offensive taste, or smell. An animal shows *aggressive mimicry* when it resembles another so that it can injure the latter or some other form which accompanies it or is not afraid of it. A well-known case of protective mimicry occurs in two species of butterflies belonging to the group of which the common monarch or milkweed butterfly is an example. *Danais erippus* is immune because of its offensive taste, and is mimicked by *Limenitis aichippus.* These both live in Central America.

4. *Warning colors.*—Bright colors are of advantage to animals that possess unpleasant qualities, such as taste and odor, as other forms can easily recognize one so colored and "pass by on the other side." This is a rather common condition among the butterflies. The above example, *Danais erippus,* serves here also, as its bright colors advertise it from afar and lessen the danger of a bird mistaking it for another species.

5. *Colors displayed in courtship.*—These are colors that appear only during the breeding season and are of common occurrence among the birds. The presence of brilliant plumage is accounted for by sexual selection, as has been explained in the discussion of feathers.

The insects are the most diverse and highly colored of animals, and examples of all the above styles may be found easily among the members of that class. They are more frequently used by authors than other forms to illustrate the various color classifications and theories. Among the vertebrates, birds undoubtedly hold first place, and one has but to examine a book on ornithology that contains colored plates to realize that the feathered animals carry all the colors of the rainbow on their backs. Bright colors in mammals are comparatively rare, their coats being usually uniform, with stripes and spots by way of variety.

A few animals are especially interesting with respect to their coverings, and I wish to discuss these separately.

1. *Whales* were for hundreds of years thought to be fishes. Their structure, when they were examined by morphologists, proved them to be mammals. They are covered with a heavy skin, and the hairs are reduced to a few isolated specimens in the neighborhood of the muzzle. The presence of blubber just under the skin no doubt accounts for the absence of hair, as it prevents the dispersal of the body heat.

2. *Elephants* are restricted in their habitat to Africa and Asia, although they once inhabited America. There are only two species now living: (1) *Elephas indicus,* with small ears, and (2) *Elephas africanus,* with large ears. Other forms have become extinct. The elephant of today has very few hairs on its body, but it has a very thick skin, which protects it from injury

and keeps in all the warmth that is necessary considering the temperature of its present home. The elephants of former times were very differently clothed. They lived in colder climates and needed more protection than that afforded by their skins. Specimens found frozen in ice in Siberia have close woolly hair, in some places three feet long.

3. *Armadillos* are small animals confined entirely to South America except one that comes as far north as Texas. They are unique among living mammals in having an armature of bony plates united into shields and rings, and covered by horny epidermis. This is just such a coat of mail as the knights of olden times used to wear when they sallied forth to do battle. The armadillo, despite these bony plates, still comes under our definition of a mammal, because here and there hairs are found protruding from the joints of the shields.

4. *Rhinoceros.*—Species of this animal occur in Africa and parts of India. The skin is very thick, with scanty hair. Similar arguments may be used here to account for the decrease of fur as were suggested with the elephants.

5. *Snowy owls, snow-buntings, ptarmigans,* and numerous other northern birds become white in winter, for no other reason apparently than that they may be better protected from enemies. Natural-selectionists. account for the change by claiming that those birds with this advantageous tendency of bleaching survive and transmit this characteristic to their progeny until the tendency results in a fully developed seasonal change.

6. *White mice, white rats,* and other animals with white fur or feathers are called "albinos." There is no coloring matter in their hair or feathers. These animals cannot exist under natural conditions, because they are conspicuous both day and night. The opposite condition is called 'melanism." This is the result of an excess of pigment in the hair or feathers. Black wolves and rabbits are melanic forms.

7. *Chimney swifts and woodpeckers* make special use of their tail feathers to brace themselves when clinging to sides of trees or chimneys. The vanes have disappeared from the end of the tail feathers of the swift, leaving a strong sharp spine.

Grouse that stay with us all winter have slender toes in the summer, but in the autumn, when snow comes, they acquire a comblike fringe on either side, which they wear instead of snowshoes until the following spring.

The tails of birds that are continually on the wing have become adapted to their mode of locomotion, and act as rudders in flight and balancers when perching.

LITERATURE

Every textbook of zoölogy will give more or less in detail information on the subjects treated in this paper; but no one book gives all. Thomson's *Outlines of Zoölogy* is the simplest and most comprehensive of the host of zoölogical textbooks. Besides a review in order of the groups of animals with a detailed study of a type under each, there are chapters on comparative physiology, geographical distribution, and the theories of evolution. Parker and Haswell's textbook is larger, and is valuable for reference. The volumes of the *Riverside Natural History* and the *Cambridge Natural History* pay more attention to the habits of the various animals and less to their anatomy. These are of great value to textile workers. All the books mentioned are well known, and are to be found in every good scientific library.

1. Thomson, J. Arthur. *Outlines of Zoölogy.* New York: D. Appleton & Co., 1899. Third edition, 819 pages, 322 illustrations. $3.50.
2. Parker, J. F., and Haswell, W. A. *Text-Book of Zoölogy.* New York: The Macmillan Co., 1897. Two volumes. Vol. I, Invertebrates; Vol. II, Chordates. $9.
3. *Cambridge Natural History.* New York: The Macmillan Co. Ten volumes by special authors.
4. *Riverside Natural History.* New York: Houghton, Mifflin & Co. Six volumes by special authors.

There is an infinite amount of literature relating exclusively to birds. Perhaps the best of these for our purposes is that by Beddard on the *Structure and Classification of Birds.* Frank M. Chapman's *Bird Life* contains a very clear account of avian peculiarities in the first eight chapters, pp. 1–83. Newton's *Dictionary of Birds,* Cone's *Key to North American Birds,* Part II on "General Ornithology," pp. 59–244, and Headley's *Structure*

and Life of Birds treat very fully such questions as the structure of feathers, molting, seasonal changes in color, migration, etc.

1. Beddard, Frank E. *The Structure and Classifications of Birds.* New York: Longmans, Green & Co., 1898. 548 pages.
2. Newton, Alfred. *A Dictionary of Birds.* London: Adam & Charles Black, 1896. 1088 pages.
3. Chapman, Frank M. *Bird Life.* New York: D. Appleton & Co., 1901. 270 pages, 75 colored plates, appendix for teachers. $2.
4. Cones, Elliott. *Key to North American Birds.* Boston: Dana, Estes & Co., 1903. Two volumes. 11552 pages.
5. Headley, F. W. *The Structure and Life of Birds.* New York: The Macmillan Co., 1895. 412 pages.

There are three books that give the general facts and theories of color in nature. Many other references might be given, but these are the ones most easily obtained, and give as full an account of the subject as is necessary for textile workers:

1. Poulton, Edward B. *The Colours of Animals.* New York: D. Appleton & Co., 1890. 360 pages, 66 figures. $1.25.
2. Beddard, F. E. *Animal Coloration.* New York: The Macmillan Co., 1895. 288 pages, 36 illustrations, 4 colored plates. Second edition.
3. Newbigin, Marion. I. *Colour in Nature.* London: John Murray, 1898. 344 pages.

EDITORIAL NOTES

Training in Citizenship

The aim of education in terms of community life is civic virtue. This is the cap sheaf. If, in a democracy, one fails as a citizen, nothing else can guarantee public service. In the earlier days of our history, when the blood was made hot by the irritating relations with the mother-country, and later when questions of territorial expansion and human slavery arose, the duties of the citizen were very closely related to those of the soldier. The trappings of war, made familiar to most people by the parade ground and by heroic description, appeal strongly to the imagination. By a proper presentation of such pictures it is easy enough to make every boy resolve to die for his country—when the time comes. It has been chiefly by such means that the spirit of our civic life has been engendered. It was developed by circumstances of which war was the central fact. Before these dramatic culminations, and for a long time after them, our wars have furnished the motive for a study of the duties of citizenship. But today the orations of Henry and the Adamses, of Clay, Calhoun, Webster, Phillips, and Sumner, have practically passed from our school literature. The masterful oratory of these men that once determined the channels of our national life is now taught to the pupils as the incident of history, utterly lacking in the vitalizing effect it once possessed. For the issues which they represented are dead; the questions that inspired the genius of those men were settled at Yorktown and Appomattox. The leaven of the Hague tribunal is beginning to work, and the real high-priest of our civilization in these days is not the devotee at the shrine of the warrior.

Citizenship and the Soldier

Vote vs. Bullet

The tendency is unmistakably toward universal peace, and in the education of the children it is much more important to keep in mind the civil qualifications of the voter than the martial characteristics of the soldier and marine. It is the vote and not the bullet that, hereafter, will transmute the theories of the citizen into the realities of practice,

despite the fact that as a means of firing the young imagination the ballot-box is not to be compared with the gun.

Voting Remote from Children

Education into citizenship, like that toward any other goal, is a growth. Citizenship, as everything else, must gradually take shape from the experiences of life, and it follows, therefore, that its political aspects which are most closely related to the voter, and which are finally determined by him, are very remote from children. And yet the science which deals with the civil administration of the affairs of society, like every other science must have its roots in the simple experiences and relations of childhood. To the pedagogic analyst it is a matter of interesting research to discover what individual experiences of his pupils are related directly to those duties of citizenship which belong to their maturer years. To synthesize in a natural way from these experiences a civil code under which the individual may both give and receive the best from society, and under which society itself may best develop—that would seem to be the chiefest aim of the teacher.

Mimic Government

We used to begin our formal training for citizenship by having the pupils commit to memory the Constitution of the United States. This in itself was enough to incite a rebellion. The plan was often supplemented by establishing a kind of a scheme for self-government, so called, which was laid down upon the same general lines as those prescribed by the Constitution for the country at large. I can well recall having helped elect a president, and other officers belonging to the republic, and of having been chosen to Congress; of having assisted in establishing a supreme court and magistracies of lesser degree—all in a small-sized school. As a bit of by-play this was an interesting diversion, but it had really nothing to do with the citizenship that belonged to our years. The fact is, our plan finally fell through because nobody ever did anything that was wicked enough to get himself into trouble by starting our legal machinery in motion. We regarded our scheme of government as a kind of elaborate net that was spread to catch somebody—and our fish were all too small!

The study of civics is often approached from a point of view that is diametrically wrong. The negative side of life is over-emphasized. The children get the idea that government is wholly a matter of restraint; that it is a trap set to catch offenders. Whereas, it is no less its real purpose to aid directly the well-doer.

Government Not a Trap

It is this aspect of civics that should be kept uppermost in the minds of children. Everything that adds to economy and efficiency in the individual and in society pertains to good government and lies at the foundation of civics. It follows that the more opportunities the school offers for the children to put themselves into some piece of work of real value, the more clearly the essentials of good government will appear to them, and the more tractable they will become. It is not without deep significance in its bearing upon the theory of government that pupils are most difficult to control in those schools that provide least for the individual physical activities of the children, and the negations of government are fewest in those schools where a great variety of handwork abounds. And, still further, it is important to observe that schools for delinquent children are laying more and more stress upon manual training of various types as an indirect means of civic control. The foundations for this study are not, therefore, to be found in those external forms of a repressive character that impose themselves upon a school, but they are in those constructive acts of adjustment, positive in character, which are intended to promote the welfare of the individual and of the whole.

Relation to Industry

Control of Delinquents

Anything that is done in a community which bears upon the organization and administration of its affairs has to do with civics. Good citizenship implies in the child, as well as in the adult, that in some way he is able to affect favorably the general good. There is no other class in the community, equaling the schools in size, teachers and pupils, that exerts so little influence, directly, upon the civil organization. This fact is usually accounted for on the theory that civic influence can be exerted only *through* the

Test for a School

ballot, and there is no other equally large part of the community that is practically disfranchised. It is still true, however, that this body should have some kind of a civic influence that should be in evidence to the boundaries of the school district. A stranger approaching the school should know when he reaches these boundaries by the marks which this influence makes upon the general welfare. This is rarely true, because the maxim, "Learn to do by doing," has seldom been applied in the study of civics. That subject is still a matter of books, lectures, and theory.

Home Interests

The paramount interest of the child is in his home. This is the corner-stone of good citizenship, for the home is the unit of the national life. Upon the integrity of the home everything depends. It is for this reason that manual training and the crafts in all of their artistic and utilitarian forms may be a direct means of upbuilding a robust civic spirit, since the output can be immediately utilized in the home. This spirit would be immensely reinforced if the care of the grounds and home surroundings were also placed largely in the hands of the children. The public-spirited parents who support local improvement associations are robbing the community of one of its chief means of training the children in citizenship. In caring for their private grounds and the affairs of the household wholly, or almost so, with hired help, parents frequently deprive their children of the best means of putting themselves into direct touch with civic life. There is no estimating the benefits that children derive from such experiences, if the parents are also participants in this work. Children cannot and will not peform these duties alone, but they will gladly join with their parents. The command "Go" is rarely heeded; the invitation "Come" always is; that is the whole secret. The movement on the part of schools and of certain associations to enlist the interests of the children in home gardening is the best work in civics that has ever been undertaken for young people. If he is thoroughly trained in the care of his home, and if he have a well-developed civic taste, the voter is apt to deposit a ballot on the side of virtue in public life. If the parents who are the patrons of

Civics and Improvement Associations

THE UNIVERSITY ELEMENTARY SCHOOL would join with their children in the planting of flowers and vines on a plot of ground about the home, however small, and, where this is not possible, if window-boxes were used, it would not only transform a large section of our city into something beautiful, they would also place a mortgage on the future through the civic ideals which such work would create in their children.

Civic Training by Newspapers

In the general movement toward better things in citizenship, there is one instrumentality, that we have been accustomed to depend upon as a leading influence in civic training, that is not living up to its opportunities. It is the public press as represented by the daily papers. There is nothing more ambitious to be classed among the educational forces of a people than the daily newspaper, and yet it is the last thing that anybody would prescribe as a part of the curriculum in any school. It is difficult to say which is the more baneful in its influence, the matter that is published or the grossly vulgar form through which the ordinary sheet offers its wares to the eye. As a debaser of public taste and opinion there is nothing now, except the crime of the "bill-boards, that is equal to it. Although the papers claim that they are catering to the public, I have yet to meet the first man who is willing to give the yellow-journal methods his approval; I have yet to meet the first person who is willing to have the average daily turned over to his children. Besides, even though it were a matter of money, the newspaper men, as well as the school-teachers, are under obligations to put some conscience into their work. They have no more right to debauch public morals and to debase the taste of children than anyone else. It need not be argued that what the pupils get from the dailies by clandestine and unwholesome methods goes a long way toward undoing the work of the school-teacher.

The average newspaper seems to think that, in order to be reputable, a paper must be dull, and that to be bright and readable it must be shocking. It therefore crams its first page with the startling, the horrible, and the vulgar, set in type of such preposterous dimensions that a self-respecting man is ashamed

to be found with a copy in his possession. The papers make a mistake. The public does not demand this—simply takes it because it must, and it does so under protest. The part of the public they seem to have most in mind is made up of the sports, the gamblers, and the sensation mongers. The papers do not commit the crimes they describe—not all of them—and therefore cannot be held responsible for them, but they are responsible for presenting them in such a way as to give the impression that practically everything on earth is rotten.

Better Editing Needed

We need a new régime in editing. The first page should be devoted to a summary of the news, with a reference possibly to a fuller statement elsewhere. A large percentage of readers would never go beyond this page, unless personal interest led to a further investigation. The space now given to murders, prize fights, and other crimes could be cut to one-sixth the amount really used, and still tell all that anybody need to know. By having to read less the public might be induced to believe more.

The Teacher vs. the Editor

At present the editor and the school-teacher are working at cross-purposes. They should be together. The school-teacher is compelled to prepare his material so that decent people can feed upon it and grow better; there is no reason why the editor should not do the same. Both the press and the school live in the same world and deal with the same facts—it is all a matter of editing, a question of relative values, of perspective. It may be necessary for us to know the plain facts about crime that we may be ready to deal with it; but it is far more important to realize that the steady persistence of one honest man has a deeper significance in terms of citizenship and civilization than all the schemes and peculations of a thousand rogues. This is the chief article in the school-teachers' creed, which both the press and the school should magnify, for upon it rests our hope in the future civic life.

W. S. J.